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Shinji Matsumoto

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FOLEY AND LARDNER LLP
SUITE 500
3000 K STREET NW
WASHINGTON, DC 20007

EXAMINER

MANCHO, RONNIE M

ART UNIT

PAPER NUMBER

3663

DATE MAILED: 10/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/828,462

Applicant(s)

MATSUMOTO ET AL.

Examiner

Ronnie Mancho

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-13 and 15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-13 and 15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>4/21/04; 8/13/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 2-13, 15, and species "A" in the reply filed on 3/31/06 is acknowledged.
2. Claims 1, 14, 16, 17 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 3/31/06.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 2, 3, 4, 5, 6, 15 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 2 and 15, the phrase "an increased tendency", "a less tendency" are indefinite.

In claim 2, "road surface irregularities" is not clear. Is the applicant referring to road friction, curvature, etc? It is not clear what all is meant and encompassed by the above phrases.

Further, in claim 2, last few lines, the limitation "in a lane marking non-detection state where the lane marking line is out of an image pick-up enabling area" is confusing. In the first few lines of claim 2, the applicant recites that lane deviation prevention is accomplished using a lane marker detector that detects a lane marking line.

In claim 3, the limitations in the last five lines are not clear

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In claim 4, the limitations in the last six lines are not clear.

Claim 5 calls for the limitations, “in a fourth state where there is an increased tendency for the host vehicle to deviate from the driving lane”; “in a fifth state where there is a less tendency for the host vehicle to deviate from the driving lane”. These limitations were already recited in parent claim 2, which reads “in a first state where there is an increased tendency for the host vehicle to deviate from the driving lane”; “in a second state where there is a less tendency for the host vehicle to deviate from the driving lane”. Claim five is therefore confusing.

In claim 6, it is not clear what all is meant and encompassed by “a substantially constant time period”. That is, time is never constant.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 2-13, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishikawa (5913375).

Regarding claim 2, Nishikawa et al (abstract, figs. 1-5; col. 5, lines 1-17; col. 6, lines 35-67, col. 7, lines 10-67) disclose an automotive lane deviation prevention (LDP) apparatus comprising:

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a lane marking detector 10 (figs. 1&3; col. 7, lines 15-24) that detects a lane marking line on a driving lane (col. 7, lines 56-62) of a host vehicle, based on a picture image in front of the host vehicle;

an actuator capable of variably adjusting a yawing motion of the host vehicle (CPU 2; adjust the turning force on the steering hence adjusting yaw; col. 8, lines 3-67);

a control unit (CPU1) configured to be electronically connected to the lane marking detector 10 (fig. 3) and the actuator for vehicle yawing motion control and LDP control purposes; the control unit comprising:

(a) a lane-deviation tendency detection section that determines (col. 7, lines 55-67), based on a detection result regarding the lane marking line, whether the host vehicle is in a first state where there is an increased tendency for the host vehicle to deviate from the driving lane or in a second state where there is a less tendency for the host vehicle to deviate from the driving lane;

(b) an LDP control section (CPU1, CPU 2, abstract, col. 8, lines 1-11, 30-67) that executes the LDP control by which the host vehicle's lane deviation tendency is avoided, when the host vehicle is in the first state;

(c) a road-surface irregularities detection section (the camera takes images of the road ahead and thus determines road irregularities) that determines whether the host vehicle is in a third state where the host vehicle is traveling on predetermined irregularities formed on or close to the lane marking line; and

(d) a vehicle yawing motion control section (CPU 2; adjust the turning force on the steering hence adjusting yaw; col. 8, lines 3-67) that executes, based on a detection result of the road-surface irregularities detection section and the detection result of the lane-deviation

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tendency detection section, vehicle yawing motion control by which the host vehicle returns to a central position of the driving lane, in a lane-marking non-detecting state where the lane marking line is out of an image pick-up enabling area.

Regarding claim 3, Nishikawa et al (abstract, figs. 1-5; col. 5, lines 1-17; col. 6, lines 35-67, col. 7, lines 10-67) disclose the automotive lane deviation prevention apparatus as claimed in claim 2, wherein: the vehicle yawing motion control section maintains a controlled variable of the LDP control at a previous value for a predetermined time period, when the host vehicle is conditioned in the first and third states in presence of a transition from a lane-marking detecting state where the lane marking line is within the image pick-up enabling area to the lane-marking non-detecting state.

Regarding claim 4, Nishikawa et al (abstract, figs. 1-5; col. 5, lines 1-17; col. 6, lines 35-67, col. 7, lines 10-67) disclose the automotive lane deviation prevention apparatus as claimed in claim 2, wherein: the vehicle yawing motion control section initiates the vehicle yawing motion control by which the host vehicle returns to the central position of the driving lane, when the host vehicle is conditioned in the second and third states in presence of a transition from a lane-marking detecting state where the lane marking line is within the image pick-up enabling area to the lane-marking non-detecting state.

Regarding claim 5, Nishikawa et al (abstract, figs. 1-5; col. 5, lines 1-17; col. 6, lines 35-67, col. 7, lines 10-67) disclose the automotive lane deviation prevention apparatus as claimed in claim 4, wherein: the control unit further comprises a lane-deviation tendency estimation section that estimates, based on the lane marking line detected by the lane marking detector before the transition from the lane-marking detecting state to the lane-marking non-detecting state, whether

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the host vehicle is in a fourth state where there is an increased tendency for the host vehicle to deviate from the driving lane or in a fifth state where there is a less tendency for the host vehicle to deviate from the driving lane; and the vehicle yawing motion control section initiates the vehicle yawing motion control by which the host vehicle returns to the central position of the driving lane, when the host vehicle is conditioned in the second, third and fourth states in presence of the transition from the lane-marking detecting state to the lane-marking non-detecting state.

Regarding claim 6, Nishikawa et al (abstract, figs. 1-5; col. 5, lines 1-17; col. 6, lines 35-67, col. 7, lines 10-67) disclose the automotive lane deviation prevention apparatus as claimed in either one of claim 2, further comprising: wheel speed sensors that detect respective wheel speeds of road wheels of the host vehicle, wherein the road-surface irregularities detection section determines that the host vehicle is in the third state, when at least one of the wheel speeds detected by the wheel speed sensors is fluctuating at a substantially constant time period determined based on a host vehicle speed.

Regarding claim 7, Nishikawa et al (abstract, figs. 1-5; col. 5, lines 1-17; col. 6, lines 35-67, col. 7, lines 10-67) disclose the automotive lane deviation prevention apparatus as claimed in claim 6, wherein: the road-surface irregularities detection section determines that the host vehicle is in the third state, only when either one of the left and right wheel speeds is fluctuating.

Regarding claim 8, Nishikawa et al (abstract, figs. 1-5; col. 5, lines 1-17; col. 6, lines 35-67, col. 7, lines 10-67) disclose the automotive lane deviation prevention apparatus as claimed in claim 2, further comprising: a vehicle-suspension up-and-down motion sensor that detects an up-and-down motion of a suspension of the host vehicle, wherein the road-surface irregularities

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detection section determines, based on the suspension's up-and-down motion detected, whether the host vehicle is in the third state.

Regarding claim 9, Nishikawa et al (abstract, figs. 1-5; col. 5, lines 1-17; col. 6, lines 35-67, col. 7, lines 10-67) disclose the automotive lane deviation prevention apparatus as claimed in either one of claim 2, wherein: the control unit further comprises a processor programmed to perform the following, (1) determining whether the host vehicle is traveling within an area except road-ways; and (2) inhibiting a check for the host vehicle traveling on the predetermined irregularities, when the host vehicle is traveling within the area except road-ways.

Regarding claim 10, Nishikawa et al (abstract, figs. 1-5; col. 5, lines 1-17; col. 6, lines 35-67, col. 7, lines 10-67) disclose the automotive lane deviation prevention apparatus as claimed in claim 2, wherein: the control unit further comprises a traveling-path condition detector that detects a host vehicle speed, a host vehicle's yaw angle with respect to a direction of the host vehicle's driving lane, a host vehicle's lateral displacement from a central axis of the host vehicle's driving lane, and a curvature of the host vehicle's driving lane; the lane-deviation tendency detection section calculates a future lateral-displacement estimate based on the host vehicle speed, the yaw angle, the lateral displacement, and the curvature; and the lane-deviation tendency detection section determines that the host vehicle is in the first state, when an absolute value of the future lateral-displacement estimate is greater than or equal to a predetermined lateral-displacement criterion.

Regarding claim 11, Nishikawa et al (abstract, figs. 1-5; col. 5, lines 1-17; col. 6, lines 35-67, col. 7, lines 10-67) disclose the automotive lane deviation prevention apparatus as claimed in claim 2, wherein: the LDP control section controls a braking force of each of the road

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wheels so that a yaw moment is produced in a direction in which the host vehicle's lane-deviation tendency is avoided, when the lane-deviation tendency detection section determines that the host vehicle is in the first state.

Regarding claim 12, Nishikawa et al (abstract, figs. 1-5; col. 5, lines 1-17; col. 6, lines 35-67, col. 7, lines 10-67) disclose the automotive lane deviation prevention apparatus as claimed in claim 11, wherein: the LDP control section calculates a braking/driving force controlled variable of each of the road wheels so that a yaw moment is produced in a direction in which the host vehicle's lane-deviation tendency is avoided, when the lane-deviation tendency detection section determines that the host vehicle is in the first state; and the LDP control section controls braking/driving forces of the road wheels, responsively to the braking/driving force controlled variables calculated.

Regarding claim 13, Nishikawa et al (abstract, figs. 1-5; col. 5, lines 1-17; col. 6, lines 35-67, col. 7, lines 10-67) disclose the automotive lane deviation prevention apparatus as claimed in claim 12, wherein: the LDP control section calculates, based on a difference between the future lane-displacement estimate and the predetermined lane-displacement criterion, a desired yaw moment to be exerted on the host vehicle; and the LDP control section calculates, based on the desired yaw moment, the braking/driving force controlled variable of each of the road wheels.

Regarding claim 15, Nishikawa et al (abstract, figs. 1-5; col. 5, lines 1-17; col. 6, lines 35-67, col. 7, lines 10-67) disclose the automotive lane deviation prevention (LDP) apparatus comprising: a lane marking detection means for detecting a lane marking line on a driving lane of a host vehicle, based on a picture image in front of the host vehicle; a yawing-motion control

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actuator capable of variably adjusting a yawing motion of the host vehicle; a control unit configured to be electronically connected to the lane marking detection means and the yawing-motion control actuator for vehicle yawing motion control and LDP control purposes; the control unit comprising: (a) lane-deviation tendency detection means for determining, based on a detection result regarding the lane marking line, whether the host vehicle is in a first state where there is an increased tendency for the host vehicle to deviate from the driving lane or in a second state where there is a less tendency for the host vehicle to deviate from the driving lane; (b) LDP control means for executing the LDP control by which the host vehicle's lane deviation tendency is avoided, when the host vehicle is in the first state; (c) road-surface irregularities detection means for determining whether the host vehicle is in a third state where the host vehicle is traveling on predetermined irregularities formed on or close to the lane marking line; and (d) vehicle yawing motion control means for executing, based on a detection result of the road-surface irregularities detection means and the detection result of the lane-deviation tendency detection means, vehicle yawing motion control by which the host vehicle returns to a central position of the driving lane, in a lane-marking non-detecting state where the lane marking line is out of an image pick-up enabling area.

MPEP 2114

The statement of intended use or field of use, "detects.....based on". "capable of", "determines, based onwhether....is in a first state.....increased tendency.....to deviate from", "executes....when", "deviation tendency is avoided when", "determines whether.....is in a third state", "executes based on.....", etc clauses are essentially method limitation or statement of intended or desired use. Thus, the claim as well as other statements of intended use

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do not serve to patentably distinguish the claimed structure over that of the reference. See *In re Pearson*, 181 USPQ 641; *In re Yanush*, 177 USPQ 705; *In re Finsterwalder*, 168 USPQ 530; *In re Casey*, 512 USPQ 235; *In re Otto*, 136 USPQ 458; *Ex parte Masham*, 2 USPQ 2nd 1647. See MPEP § 2114 which states:

A claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ 2nd 1647.

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than functions. *In re Danly*, 120 USPQ 528, 531.

Apparatus claims cover what a device is not what a device does. *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 15 USPQ2d 1525, 1528.

As set forth in MPEP § 2115, a recitation in a claim to the material or article worked upon does not serve to limit an apparatus claim.

The prior art anticipate the structural limitations in the apparatus claims. Even if the prior art did not perform the method limitations recited in the apparatus claims, which the examiner is not conceding, it is believed that the structural arrangement in the prior art is capable of performing the method limitation recited in the apparatus claims.

Communication

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ronnie Mancho whose telephone number is 571-272-6984. The examiner can normally be reached on Mon-Thurs: 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ronnie Mancho
Examiner
Art Unit 3663

October 2, 2006


JACK KEITH
SUPERVISORY PATENT EXAMINER